

REMARKS

This Amendment and Response is believed to be responsive to the Final Office Action mailed February 9, 2006. In that action: claims 1, 15-24, and 40-42 were pending, the remainder having been withdrawn; claims 40-42 were determined to be directed to a non-elected invention; claims 1 and 15-24 were rejected under 35 USC 112, second paragraph; claims 1, 15, 17, and 19 were rejected under 35 USC 102(b) as anticipated by Popovich (WO 00/07058); claims 16 and 20-23 were rejected under 35 USC 103(a) as obvious in light of Popovich; and claims 18 and 24 were objected to as being dependent upon a rejected claim but allowable if amended into independent form. On May 9, 2006, an Amendment and Response after Final was filed. An Advisory Action was apparently mailed on May 22, 2006, in which the claims were not entered.

Claim 1 is now amended. The second amendment (line 3) is made to address the 112 rejection, the third amendment (line 5) is made to clarify claim language, and the remaining amendments (lines 2 and 6-9) are made to further distinguish over the prior art of record. New claims 43-51 have been added. These claims are believed to be patentable because none of the prior art is believed to teach or suggest a display device including a reflective image-generating arrangement configured to reproduce images, the images being visible to a viewer when the device is operated in either of two modes, including a first mode wherein the device produces a real image of the image-generating arrangement, the real image being suitable for direct viewing by the viewer, and a second mode wherein the device produces a virtual image of the image-generating arrangement, that is not a reflection of a real image of the image-generating arrangement projected onto a projection screen, as claimed in independent claim 43. This claim is directed to the same invention as claim 1, as the limitations in claim 43 are similar to and

alternative language to the limitations in claim 1. Furthermore, new dependent claims 44-51, which are ultimately dependent on claim 43, are identical to claims 15-22, so they are directed to the same species. Reconsideration of the rejection of the rejected claims and examination of the new claims is hereby requested.

Independent claim 1 has been rejected as anticipated by Popovich. Examiner's "Response to Arguments," and "Claim Rejections – 35 USC §102" both argue that Popovich Figures 6A and 6B illustrate the invention claimed by the present applicant, even with regard to the limitation that in a second mode "the device produces a virtual image of the image generating arrangement without producing a real image of the image generating arrangement." Applicant respectfully but forcefully disagrees; in every arrangement illustrated by Popovich that shows a virtual image, the virtual image is produced from an intermediate real image of the image generating arrangement.

Popovich appears to disclose a visual display apparatus with reconfigurable holographic optics. A display panel can be viewed in different modes including a public mode with a real image of the display panel projected onto a screen (602 in Figures 6A and 6B and 702 in Figure 7) for viewing by multiple people and a private mode with a virtual image of a projected image of the display panel. In the private mode, private projection optics (605 in Figures 6A and 6B and 705 in Figure 7) project a *real* image of the display panel onto an intermediate screen (passive diffuser 603 in Figures 6A and 6B and reconfigurable holographic diffuser 703 in Figure 7). The real image on the intermediate screen *appears as a virtual image* to the person using the video display apparatus via a reflection from a reconfigurable holographic mirror (601 in Figures 6A and 6B and 701 in Figure 7).

In the “Response to Arguments” section of the Final Office Action, at pages 3-4, the Examiner states “Figure 6a and 6b further illustrate ... a virtual image 615 [that] is displayed in private mode.” This statement is absolutely incorrect and helps to explain the Examiner’s continued rejection of allowable claims. In fact, it is completely clear that 615 is a bi-directional arrow that represents a real image, not a virtual image. The real image 615 is formed on a passive diffuser. A reflection of this real image 615 can be seen when the viewer looks at holographic mirror 601. Thus, the viewer sees a virtual image in the mirror 601. Figure 2A of Popovich shows (and the accompanying text at page 12, line 22 - page 13, line 15 describes) how a virtual image 204 is seen when a viewer looks at mirror 203 and sees a reflection of real image 202.

Applicant submits that “virtual image” is a term well understood in the art to preclude the formation of the virtual image on a diffusive screen. For example, in Modern Optical Engineering by Warren J. Smith (McGraw-Hill, Boston, 1990), the author states on p. 10:

Thus a virtual image may be observed directly or may serve as a source to be reimaged by a subsequent lens system, but it cannot be produced on a screen. Similarly, in Introduction to Physics for Scientists and Engineers by Frederick J. Bueche (McGraw-Hill, New York, 1986) we find (p.624):

This type of image, one through which the observed rays do not actually pass, is called a virtual, or imaginary, image. In other words, the rays reaching the eye do not really come from the point they seem to come from. There is no possibility whatsoever that a sheet of paper placed at S’ behind the mirror would have a lighted object appear on it.

Most succinctly, perhaps, in Fundamentals of Optics, by Francis A. Jenkins and Harvey E. White (McGraw-Hill, New York, 1950) is stated (p. 42):

A virtual image cannot be formed on a screen.

Copies of each of these references are attached for the Examiner's convenience.

In light of the above well-accepted definition of virtual image, the teaching of Popovich should be reconsidered. The Examiner states:

Figure 6a and 6b further illustrate the same display using a holographic display element (also using reflective and refractive elements) where a real image (in the plane of the display) 614 is displayed in public mode and a virtual image 615 (projected toward or in front of the user for example - see page 14) is displayed in private mode that was created from the same image generation source (see figure 6b for illustration) via projection elements 605/603 (see page 23). Thus the private mode projection doesn't create the virtual image in the plane of the display 609 and meets the claimed limitation of not producing a real image in the mode of that produces a virtual image.

Popovich discloses (p.26):

During the private mode of operation of the display apparatus 600, the private mode projection optics 605 projects light representing an image on to the passive diffuser 603, such that a magnified version of the image (indicated by the bi-directional arrow 615) is formed at the passive diffuser 603.

Clearly the "magnified version of the image (indicated by the bi-direction arrow 615)" is formed on a screen. Therefore it cannot, as construed by the examiner, be a virtual image. It can only then be a real image. Real image 615 is akin to the "input image" 212 illustrated in Popovich Figure 2A. Virtual image 204 is on the opposite side of mirror 203/601 to the input image 212/615. Thus, the Popovich embodiments do not meet the limitations of Applicant's claim 1.

Nevertheless, despite the fact that the claim as previously written clearly distinguished over Popovich, in the interest of expediently moving the case toward allowance, the applicants have further amended claim 1 to include the limitation suggested by the Examiner. As can be appreciated, amended claim 1 is further distinguishable over Popovich since it claims a display

device with a reflective image-generating arrangement that reproduces images, the images being visible in a first mode wherein the device produces a real image of the image-generating arrangement, the real image being suitable for direct viewing by the viewer, and visible in a second mode wherein the device produces a virtual image of the image-generating arrangement, wherein the light that forms the virtual image proceeds from the image-generating arrangement to the viewer without being scattered by a diffusive screen. Popovich produces a virtual image that is a reflection of a real image projected onto an intermediate diffusive projection screen. Claim 1 distinguishes over this design with the above underlined limitation. Thus, claim 1 is patentable over Popovich and the remainder of the cited prior art. Pending dependent claims 15-17 and 19-23 are patentable for the same reasons and because of the additional limitations therein. Of course, dependent claims 18 and 24 have already been noted as containing allowable subject matter.

In addition, now that generic claim 1 is patentable, the withdrawn dependent claims (2-14, 25-34, and 40) to species other than those claimed in dependent claims 15-24 can and should be considered as noted in the Restriction Requirement mailed December 14, 2004. The same logic applies to independent claim 41 and dependent claim 42. It is respectfully requested that these claims be examined and allowed.

Based upon the foregoing, Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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